MEDION®

Service Manual

19-inch Color Monitor
B1997PNST (MD 1998LE)

Service Manual Versions and Revision

No.	Version	Release Date	Revision
1.	1.0	Nov. 21, 2000	Original release

MD 1998LE (B1997PNST) Service Manual.

Printed in Taiwan.

Table of Contents

1 Precautions

Please follow these safety and servicing precautions to prevent damage and to protect against potential hazards such as electrical shock and X-rays.

1-1 Safety Precautions

1-1-1 Warnings

1. For safety purpose, do not attempt to modify the circuit board, and always disconnect the AC power before performing servicing on the monitor.
2. Operation of the monitor outside its cabinet or with the cover removed involves the risk of shock hazard. Repair work on the monitor should only be attempted by service personnel who are thoroughly familiar with all necessary safety precautions and procedures for working on high voltage equipment.
3. Do not lift the CRT by the neck. After completely discharging the high voltage anode, handle the CRT only when wearing shatterproof goggles. Try to keep the CRT away from the body during handling.
4. High voltage should always be kept at the rated value, no higher. Only when high voltage is excessive are X-rays capable of penetrating the shell of the CRT. Operation at high voltages may also cause failure of the CRT or high voltage circuitry.
5. The CRT is especially constructed to limit X-ray emission to 0.5mR/HR at 300 microamperes anode current. To ensure continued X-ray protection, replace the CRT with only the same or equivalent type as the original, and adjust the anode's voltage to the designated maximum rating, never to exceed.

1-1-2 Safety Checks

Before returning the monitor to the user, perform the following safety checks:

1. Inspect to make certain that each lead dress is not pinched or that hardware is not lodged between the chassis and other metal parts in the monitor.
2. Inspect all protective devices such as nonmetallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacitor networks, mechanical insulators, etc.
3. AC Leakage Current Check

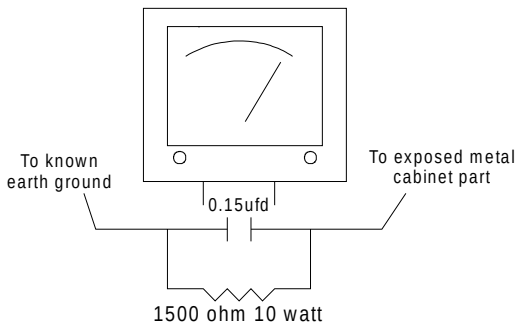
   Always perform the AC Leakage Current Check on the exposed metal parts, including metal cabinets, screwheads and control shafts, as follows:

   a) Plug the AC line cord directly into a rated AC outlet. Do not use an isolation transformer during the check.

   b) Use an AC voltmeter with at least 5000 ohms per volt sensitivity as follows:

   Connect a 1500 ohms, 10 watt resistor paralleled by a 0.15uF AC capacitor in series with all exposed metal cabinet parts and a known earth ground, such as electrical conduct or electrical ground connected to earth ground, as shown in the Figure 1-1. Measure the AC voltage across the combination of resistor and capacitor.

Figure 1-1. Set Up For AC Leakage Current Check



   c) Reverse the AC plug at the AC outlet and repeat the steps for AC voltage measurements for each exposed metal part.

   d) Voltage reading must not exceed 0.3 volts RMS, equivalent to 0.2 milliampere AC. Any value exceeding this limit ill constitute a potential shock hazard and must be corrected immediately.

1-1-3 Product Safety Notices

Many electrical and mechanical parts in this chassis have special safety-related characteristics which are often not evident from visual inspection, the protection afforded by them may not be obtained by replacing them with components rated for higher voltage, wattage, etc. Before replacing any of these components, consult the Recommended Spare Parts List given at the end of this manual. Any of the replacements that do not provide the same safety characteristics may result in shock, fire, X-ray emission or other hazards.

1-2 Servicing Precautions

Warning: An electrolytic capacitor installed with the wrong polarity might explode.

Caution: Before performing servicing covered by this service manual, read and follow the Safety Precautions section of this manual.

Note: If unforeseen conflict between the following servicing precautions and any of the safety precautions, always follow the safety precautions

1. Follow closely the servicing precautions printed on the monitor cabinet and chassis.
2. Always unplug the AC power cord from the AC power source before removing or installing any component or assembly, disconnecting PCB plugs or connectors and connecting a test component in parallel with a capacitor.
3. When replacing parts or circuit boards, clamp the lead wires around the component before soldering.
4. When replacing a high wattage resistor (>0.5W metal oxide film resistor) in the circuit board, keep the resistor about 1 cm (1/2 inch) away from the circuit board.
5. Keep wires away from the high voltage or high temperature components.
6. Keep wires in their original positions so as to minimize interference.
7. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the positive lead; always remove the instrument's ground lead last.

After putting the rear cover back and make sure the monitor is working properly, the Hi-Pot & Ground Continuity tests **MUST BE** performed before the monitor is returned to user.

1-3 Hi-Pot Test

1. Test Equipment

   Puncture test model PM5530 ADT or KIKUSU TOS-8750 voltage tester or equivalent approved equipment.

Note : The test equipment must be calibrated in regular period.

2. Test Setup
   a) Apply voltage : DC 2100 VDC
   b) Test duration : 3 seconds
   c) Cutoff current should be set to 3 mA
3. Test Procedure
   a) Unplug power cord from AC source.
   b) Put the power switch of the monitor in the "ON" position.
   c) Leave signal cable unconnected.

d) Plug monitor power cord to the Hi Pot tester terminals.
e) Turn on tester and watch the indicator or beeper.
f) If the indicator lamp lighten, or beeper beeps, the test fails.

1-4 Ground Continuity Test

1. Test Equipment

   AC low ohm tester TOS-6100 or equivalent approved equipment.

Note : The test equipment must be calibrated in regular period.

2. Test Setup
   a) Test duration : 3 seconds
   b) Set current limit at 25 A
   c) The grounding resistance must be less than 0.1 ohm.
3. Test Procedure
   a) Plug the monitor power cord to the tester terminals.
   b) Make sure all connections are well-contacted.
   c) Turn on monitor power and tester power.
   d) Press “Test” button.
   e) If green light shows up, means test OK.
      If red light shows up, means test fails.
   f) If the Tester has a digital display, the resistance value must not exceed 0.1 ohm.

Note : Be sure not to touch the metal portion of the signal cable head during testing.

2 Product Specifications

2-1 Specifications

Picture Tube	19-inch (18-inch Visual image area), 95 degrees deflection, dot type black matrix, medium short persistence phosphor, dark bulb,direct etch, Flat square screen with Invar Mask, 0.26 mm dot pitch
Scanning Frequency	VGA, Super VGA, 1024x768@60/70/75/85/100 Hz, 1280x960@85 Hz 1280x1024@60/75/85 Hz, 1600x1200@60/75 Hz
Maximum Resolution	1600 dots (H) x 1200 lines (V) @75 Hz refresh rate
Display Area	360 mm (H) x 270 mm (V) typical
Display Characters	80 char. x 60 rows on a 10 x 10 matrix
Display Colors Analog Input	Unlimited Colors
Synchronizatin Signals	Separate Sync: horizontal/vertical, TTL, positive or negative
Synchronization Frequencies	Horizontal : 30 to 98 kHz Vertical : 50 to 120 Hz
Signal Connectors	15-pin, D-shell connector
Video Signals	Analog : 0.7 Vp-p, RGB positive
Power Input	150 Watts maximum (PHILIPS CRT) AC rated voltage, 90VAC to 264VAC
Misconvergence	Center Area : ≤ 0.2 mm; Corner Area : ≤ 0.35 mm
User Controls	Power On/Off, Contrast, Brightness, Horizontal Size, Horizontal Position, Vertical Size, Vertical Position, Pincushion, Trapezoid, Rotation, Unbalance, Parallelogram, Degauss, Top Corner, Bottom Corner, Recall, V. Moire, H. Moire
Service Controls	PWB1498 : power voltage adjust (VR801), high voltage adjust (VR102), F1/F2/G2 (FBT)
Preset Modes	13 (see Table 2-2. Timing Chart)
Environmental Considerations	Operation temperature : 10°C to 35°C ambient Humidity : 20% to 80% ambient Storage temperature : -40°C to 65°C ambient Storage Humidity : 10% to 90% (non-condensing) Altitude : up to3000m above sea level

Note: Above specifications are subject to change without prior notice.

2-2 Signal Cable Pin Connections

Table 2-1. Signal Cable Pin Assignment

Pin	Signal	Pin	Signal
1	Red video	9	+5V (from PC)
2	Green video	10	Ground
3	Blue video	11	Ground
4	Ground	12	SDA
5*	NC	13	H-Sync
6	Red ground	14	V-Sync
7	Green ground	15	SCL
8	Blue ground		

Note: This pin is used for selftest detection. Connect this pin to ground at the PC end.

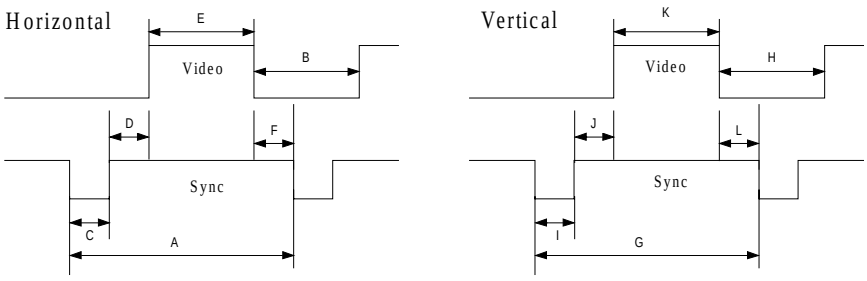
2-3 Timing Chart

This section describes the timings that the computer industry recognizes as standard for computer-generated video signals.

Table 2-2. Timing Chart

Mode	1	2	3	4	5	6	7	8	9	10	11	12	13
H. Dots	640	720	640	800	1152	800	1024	1024	1280	1280	1024	1600	1280
V. Dots	480	400	480	600	864	600	768	768	1024	1024	768	1200	960
H-freq (kHz)	31.47	37.93	43.27	46.8	67.5	53.67	60.03	68.67	80	91.146	80	93.75	85.938
Sync Polarity	-	-	-	+	+	+	+	+	+	+	+	+	+
A period us	31.78	26.366	23.11	21.33	14.815	18.631	16.66	14.561	12.504	10.971	12.376	10.667	11.636
B Blking us	6.356	6.085	5.33	5.172	4.148	4.409	3.657	3.725	3.022	2.844	3.624	2.765	3.017
C Sync us	3.81	2.028	1.556	1.616	1.185	1.138	1.219	1.016	1.067	1.016	1.231	0.948	1.077
D B.P. us	1.907	3.042	2.22	3.232	2.37	2.702	2.235	2.201	1.837	1.422	2.12	1.501	1.508
E Active us	25.42	20.282	17.78	16.16	10.667	14.222	13	10.836	9.481	8.127	8.752	7.901	8.62
F F.P. us	0.636	1.014	1.556	0.323	0.593	0.569	0.203	0.508	0.119	0.406	0.273	0.316	0.431
V-freq (Hz)	59.94	85.04	85	75	75	85	75.03	84.99	75	85	100	75	85
Sync Polarity	-	+	-	+	+	+	+	+	+	+	+	+	+
O Period ms	16.68	11.759	11.76	13.33	13.333	11.756	13.33	11.765	13.329	11.761	9.988	13.333	11.764
P Blking ms	1.43	1.213	0.67	0.533	0.533	0.578	0.533	0.582	0.525	0.527	0.483	0.533	0.593
Q Sync ms	0.064	0.079	0.069	0.064	0.044	0.056	0.05	0.044	0.038	0.033	0.074	0.032	0.035
R B.P. us	1.02	1.107	0.578	0.448	0.474	0.503	0.466	0.524	0.475	0.483	0.397	0.491	0.547
S Active us	15.25	10.546	11.09	12.8	12.8	11.179	12.8	11.183	12.804	11.235	9.505	12.8	11.171
T F.P. us	0.35	0.026	0.023	0.021	0.015	0.019	0.017	0.015	0.013	0.011	0.013	0.011	0.012

Seperate Sync



H.Parameters:

A: Period
B: Blanking Time
C: Sync Width
D: Back Porch
E: Active Time
F: Front Porch

V.Parameters:

G: Period
H: Blanking Time
I: Sync Width
J: Back Porch
K: Active Time
L: Front Porch

2-4 Display Power Management Signal (DPMS)

Note: These power-saving states exceed the Environmental Protection Agency (EPA) Energy Star requirements and the Video Electronics Standard Association (VESA) for Display Power Management Signal (DPMS) .

Table 2-3. Display Power Management Signal (DPMS)

State	LED Color	H-Sync	V-Sync	Power Consumption
ON	Green	Pulse	Pulse	Normal
STANDBY	Yellow	No Pulse	Pulse	<15 watts
SUSPEND	Yellow	Pulse	No Pulse	<15 watts
OFF	Amber	No Pulse	No Pulse	<8 watts

2-5 TCO Version

The monitor meets the energy saving, electric and magnetic field requirements. Also it is compliant with TCO 99 labelling scheme.

2-5-1 TCO 99 Version

TCO 99 will append the color temperature specification.

3 Operation Theory

This is an I2C-bus fully digital controlled multi-sync color monitor, compliant with VESA DDC1/2B and DPMS standards. Besides, it also meets TCO95 and MPRII requirements. It provides user friendly OSM (On-Screen display Menu) controls, and offers the following main features.

3-1 Main Features

1. Simplified chassis design with minimum components.
2. Fully digital controlled via 8-bit microcontroller NT6861AU.
3. Auto switching to off mode under “OUT OF RANGE” (Fh < 29KHz or Fh > 99KHz).
4. Reliable chassis design through various internal circuit protections.
5. Universal full range AC input and low power consumption.
6. Five-country OSM language available for easy user controls.
7. Adjustable OSM display time and position.
8. Twelve preset modes up to 1600 x 1200 75Hz (Fh =93.75KHz).

3-2 Microcontrol Section

1. The microcontroller provides I2C bus (pin 27 & 28) for geometric controls via I401 TDA4856 and video controls via I501 M52743. The geometric controls include H-size, H-position, V-size, V-position, Pincushion, Pin-balance, Trapezoid, Corner, Parallelogram, H-focus, V-focus, H-moire and V-moire. The video controls cover Contrast, Brightness, R/G/B gain and cutoff control alignments. Through 8-bit PWM’s (pin 1, 2, 3, 32, 36, 40) it provides factory controls for G1, NS-trapezoid, H-linearity, ABL, user control for Rotation and one F/V for H-frequency driver compensation . Two I/O’s (pin 27, 28) are provided for I2C bus used for I502 MTV021N-21 on-screen display.
2. In addition, the microcontroller offers Auto Mode detection via Hsync (pin 41) and Vsync (pin 42) inputs. According to Auto Mode detection, VESA DPMS power saving (pin 29, 30) will limit the output power under 15W for Standby or Suspend mode, under 8W for OFF mode. VESA DPMS mode indication is done via I/O pin 17 & 18 to drive LED display on the front cover. Normal mode displays green LED, Standby or Suspend modes displays Yellow LED while OFF mode displays Amber LED.
3. Auto factory alignment (ATE) and VESA DDC2B communication are through DDC I2C bus (pin 27, 28), I704 24LC211 is dedicated for DDC EDID E2PROM. In order to get optimal H-linearity performance for the full range frequency (31KHz - 98KHz), 4-channel CS are used at pin 20, 21, 22, 23, 24. F1, F2, UP and DOWN function keys’ scanning are through 2 ADCs on pin 14 & 15. Q701 and Q702 delay circuits are used for power-on reset at pin 4. In order to avoid I2C interference during H-size, H-position, V-size, V-position, Contrast and Brightness alignments, the HUNLK from I401 TDA4856 is applied from Q703 inverter to IRQ at pin 16.
4. There are 12 factory preset modes and 8 user modes available. Related information data of those modes are stored at 2 EEPROM’s (I702, I703) 24LC04.

3-3 Deflection Section

1. I^2C -- autosync deflection controller is TDA4856.
2. The TDA4856 is a high performance and efficient solution for autosync monitors. All functions are

controllable by I²C bus. SDA and SCL signals coming from microprocessor feed to pin 19 and pin 18 to control all functions.

3-3-1 Horizontal Section

1. The oscillator is driven by the currents in R424 and R423. The minimum oscillator frequency is determined by R424 and the maximum frequency is determined by R423.
2. Horizontal sync goes into pin 15 through R314. And horizontal flyback pulse goes into pin 1 through C455, C437, R404, C458, R40E and bypass filter C401 from Vcp of Q424 collector for AFC loop.

3-3-2 Horizontal O/P Section

1. Horizontal driver (pin8) signal is sent to Q402 via R496, C451.
2. Signal from Q427 direct drive T403, through R493 (shunt with R4A4, R40F, R40G) and L405 to horizontal output transistor Q424.

3-3-3 Vertical Section

1. Vertical sync signal from micro controller is connected to pin 14 through R313.
2. The free running frequency is determined by R319 and C312.

3-3-4 Vertical O/P section

1. The differential output currents from pin 13 of Vout1 and pin 12 of Vout2 can be directly coupled to the vertical deflection booster pin 1 and pin 2 of TDA8351.
2. The TDA8351 has two output stages which are current driven in opposite phase and operate in combination with the deflection coil in a full bridge configuration.

3-3-5 E-W/Trapezoid and H. Size Controls

1. The B+ driver for step down circuit is from pin 6, it provides 20~80% duty cycle outputs according to H-frequency.
2. The E/W / Trapezoid and H-size controls are through B+ modulation at I401 TDA4856. The EW output signal is from pin 11, it's not tracking with H-frequency.

3-3-6 X-Ray Protection

1. To avoid X-ray hazard, a DC voltage generated at pin 3 of FBT and rectified by D108, C121 is divided by R126, R129 and C402 filter go into pin 2 of TDA4856.
2. If this voltage is higher than 6.39 V, then TDA4856 will be activated to float HUNLOCK (pin 17), H. DRV (pin 8), B DRV (pin 6), VOUT1 (pin 12), VOUT2 (pin 13). After that all deflection circuit stop working.

3-3-7 G1, Blanking and Brightness

1. The vertical blanking signal comes in two ways. One is from pin 8 of I301 (TDA8351), the other is from HUNLK (pin 17 of I401). These two positive vertical pulses through Q42A, Q42C, Q42E amplified and converted into negative pulse and sent to G1 for vertical blanking.

2. In protection mode or out-of-range situation, HUNLock will send 5 V pulse to saturate Q706, then pin 8 of I902 will be low state and open Q509, so G1 will go down to -140V. During the mode change, Mute acts as same as HUNLock's.
3. The brightness is controlled by CPU, pin 27 and pin 28 comes into pin 20 and pin 21 of I501, DC level can be changed by I^2C bus from 0~5V of D/A output at pin 23 of I501, high voltage causes high current to get brighter raster, low voltage gets lower brightness.

3-4 Power Supply Section

3-4-1 AC Rectifier

The circuit can accept 90 V to 264 V AC input through D801 bridge diode and C810 filtering to get DC 126 V~364 V for power conversion in T805.

3-4-2 Line Filter

It consists of L801, L802, P801A, C803, C804, C805, C806, C807, C871, C80A, C80C, C80E, T801 and T802 and meets EMI regulation.

3-4-3 PFC

It consists of T804, Q814, D807, I804 and other auxiliary components. It is similiar to Booster circuit. The working voltage is provided by D815, C821, R825, C819 and ZD810, but it is not working in Stand-by, Suspend and Off modes. The output voltage C810 is 180 V~380V DC and generated through input voltage C816 step up. The maximum voltage is decided by R826 and R827, while the minimum voltage is decided by C817. In the meanwhile, it will get a similiar to input voltage waveform of input current to acquire a good PF value.

3-4-4 Power LED Status

1. The LED has 3 leads common cathode with green and amber color for different power saving states. It is controlled by CPU.
2. Normal : Green light

   Amber LED is off because CPU pin 17 is high and pin 18 is low, only green LED is turned on.
3. Standby / Suspend : Yellow light

   CPU pin 17 and pin 18 are low, then green and amber LED are turned on. That is yellow.
4. Off Mode : Amber light

   CPU pin 18 is high and pin 17 is low, then green is off and amber is on.

3-4-5 Auto Degaussing

When SMPS works, the 6.6 V power source is applied to Q801 and CPU let Q801 turn on a few seconds, then drive the armature of RL801 to perform the degaussing function.

3-4-6 PWM Control

1. Start Up

   The I802 gets power from C874, C841, R834, ZD807, D802, C859, R806 and pin 7 voltage reaches 9 V for starting up. The I802 starts oscillation at 20 kHz, sawtooth on pin 4 and pin 6 output to drive Q802/ T805. Once Q802 switches on, D812, C840 set up an 17 V to keep I802 working through D828 auxiliary

voltage.

2. Regulation

   The DC O/P voltage is proportional to the auxiliary voltage, so I802 pin 2 senses the feedback voltage from the divider R895, R888, R868, R897 and VR801 to compare with the built-in 2.5 volts reference voltage for error amplifier operation. Finally pin 6 can modulate the different duty cycle by VR801 setting to achieve regulation purpose.

3-4-7 Synchronization

1. Normal Mode

   The sync pulse from FBT (31 kHz~93.75 kHz) via R820, C833, D806, R818 and C832 to pin 4 of I802 to keep I802 synchronized with horizontal sync input frequency.

2. Power Saving Modes: Standby/Suspend

   Because there is no pulse from FBT, so the free-run frequency is decided by R817 and C832 and the SMPS works at 20 kHz.

3. Override

   The horizontal free run frequency is about 62 kHz under override condition, SMPS is synchronized to this frequency.

3-4-8 O.V.P.

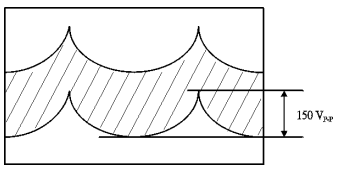
If the auxiliary voltage is higher than zener voltage ZD806 (22 volts) and makes pin 3 of I802 higher than 1 V, pin 6 duty cycle is limited to have the OVP activated.

3-4-9 O.P.P.

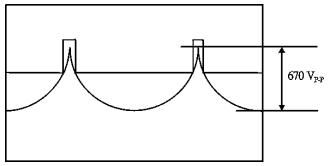
The excess current of T805 through R819 can develop enough voltage on pin 3 then limit the power delivered because the pin 6 duty cycle is limited too.

3-5 HV Supply

1. HV (High Voltage) start up is triggered by H-pls at pin 4 via R107. I103 3843 provides the PWM output control (pin 6) to drive the step up B+ supplier Q103 via D105 and C108.
2. The time constant is dependent on the H-DRIVER through R140 via inverter I101 and buffer Q106 /Q107 to drive Q104.
3. I401 pin 32 provides the H+V composite signals to drive the two-stage dynamic focus amplifier. Output of vertical amplitude is around 150 Vpp, while output of horizontal amplitude is around 670 Vpp.



Vertical dynamic focus



Horizontal dynamic focus

3-6 Video Amplifier Section

1. RGB signal inputs are terminated by R501, R531 and R561 then pass through the coupling capacitors C502, C532 and C562 to I501 M52743BSP preamplifier.
2. The amplifier RGB signals (0~3 Vpp) are adjusted by I^2C bus, pin 19 is for clamp pulse which comes from pin 16 of TDA4856 to set up equal clamp level.
3. The video output stages is I901 LM2402, the output resistors R904, R934 and R964 are 47 ohm, R913, R943 and R973 are 56 ohm for arcing protection and the power dissipation is minimized.
4. The RGB cathodes cut off are adjusted by D/A output pins 24, 25, 26 of I501.

4 Alignments and Adjustments

This section of the service manual explains how to make permanent adjustments to the monitor settings.

4-1 General Adjustments

4-1-1 Adjustment Conditions

a) Power Supply

Apply AC 115 V or 220 V

b) Warm-up Time

The monitor must be powered on for 15 minutes before starting any alignment, but requires 30 minutes of warm-up time for convergence adjustment.

c) Signal Input

1. Video: RGB Analog, 0.7 Vp-p, positive
2. Synchronization: Horizontal and vertical TTL signal, separate, positive or negative
3. All adjustments should be made using a signal of FH = 93.75 kHz, FV = 75 Hz, unless otherwise defined.

4-1-2 Equipment Required

The following equipments are necessary for adjustment procedures:

1. Volt-ohm-A meter (Sanwa FD-750C or equivalent)
2. 30 kV high voltage probe (HP34111A)
3. Oscilloscope (TEK2235 or equivalent)
4. Minolta Color Analyzer II
5. Signal generator (IBM PC with proper display cards or Chroma 2250 or equivalent)
6. Screwdriver

4-1-3 Switching Power Supply and Regulator Adjustment

a. The regulated B+ control has been preset in the factory and needs no adjustment. However, if any repair is made on the power supply section, the following readjustment procedures are recommended:

1. Allow the monitor to warm-up for about 15 minutes.
2. Apply (1600 x 1200 @ 93.75Khz / 75 Hz) / crosshatch pattern to the monitor.
3. Connect a DC voltage meter to D820, Heat Sink and adjust VR801 for 17.5 ± 0.1 V.
4. If a fuse is broken during adjustment, remember to replace it with the exact same type of fuse.

b. If necessary, follow the following procedure to enter the factory preset mode:

1. At power off mode, turn S701 SW to alignment position close to CRT side.
2. Press both [1] key and [2] key simultaneously then power on to enter the factory preset mode.
3. Turn on the power again to return back to normal mode (user mode).
4. After finishing the manual alignment, S701 SW has to be returned back to its normal stage (close to FBT side). Otherwise the DDC can not be read.

4-2 Alignment Procedures

4-2-1 High Voltage Adjustment

CONDITION

Display image : Crosshatch pattern

PROCEDURE

Connect DC meter to TP001 and adjust VR102 to obtain a DC voltage of -152 ± 1V DC .

4-2-2 Screen and White Balance Adjustment

CONDITION

Switch S701 to factory mode, then press "1" and "2" buttons simultaneously when switching the power "On".

Warm up 30 minutes

Mode : 93 KHz / 1600 x 1200

Display image : No video

PROCEDURE

1-a Set Brightness to maximum, G1 at "70" OSD-step, and G2=625 V, Contrast to maximum.
Select "preset color" then choose "9300°K"

1-b Adjust Green cut-off around "70" OSD-step.

1-c Adjust G1 and R/B cut-off to get 0.8+0.15 / -0.1 FL of raster light output.

1-d Confirm x=283±5, y=297±5.

CONDITION

Display image : 50 mm x 50 mm white block pattern

PROCEDURE

2-a Set Brightness to mid-level.

2-b Adjust Contrast to maximum.

2-c R/B signal off and adjust green gain to get Y=25 ± 0.2 FL.

2-d R/B signal on, adjust R/B gain to get x=283±5, y=297±5.

CONDITION

Display image : Full white pattern

PROCEDURE

3-a Set Brightness and Contrast to maximum.

3-b Adjust "ABL" to 32±1 FL.

4-a Repeat all the procedure in 4-2-2 section until the best white balance is obtained, then power off.

4-b After screen and white balance adjustments, S701 must be switched to Normal mode.

4-2-3 Focus Adjustment

CONDITION

Display image : “e” character pattern

PROCEDURE

1. Set Brightness and Contrast used for a normal display.
2. Adjust the static focus control on the high voltage resistor block to obtain the best focus over the entire display area.

4-2-4 Static Convergence Adjustments

Static convergence involves alignment of the red, blue and green lines in the center area of the display.

Note : The monitor requires 30 minutes of warm-up time for convergence adjustment.

CONDITION

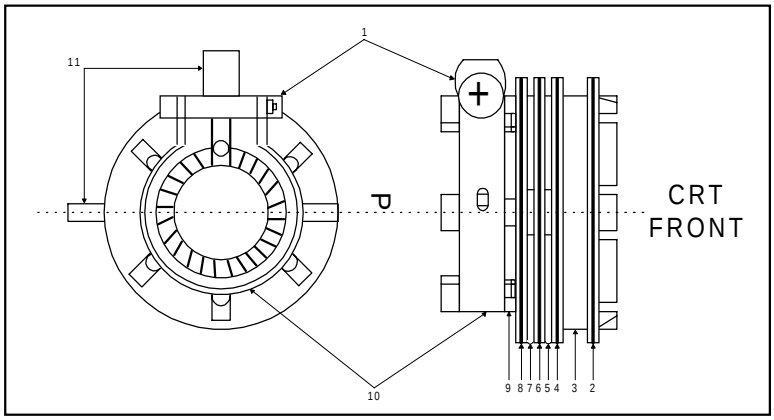
Display image : Crosshatch pattern

Warm-up Time : 30 minutes

PROCEDURE

1. Set Brightness and Contrast to display a well-defined pattern.
2. Ensure the convergence magnet rings are correctly positioned on the CRT.

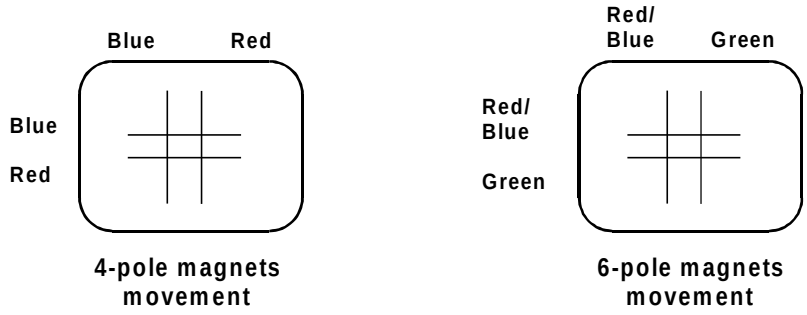
Figure 4-1. Convergence Magnets on the CRT



1) Setup Bolt	2) Bow Magnet	3) Band	4) 2-Pole Magnet
5) Spacer	6) 4-Pole Magnet	7) Spacer	8) 6-Pole Magnet
9) Holder	10) Band	11) Tabs	

3. Rotate the individual rings of 4-pole convergence magnets by changing the spacing between the 2 tabs to converge the vertical red and blue lines at the center of the screen.
4. Rotate the pair of rings of 4-pole convergence magnets by maintaining spacing between the 2 tabs to converge the horizontal red and blue lines at the center of the screen.
5. Rotate the individual rings of 6-pole convergence magnets by changing the spacing between the 2 tabs to converge the vertical red, blue and green lines.
6. Rotate the pair of rings of 6-pole convergence magnets by maintaining spacing between the 2 tabs to converge the horizontal red, blue and green lines.
7. Repeat the steps from 3~6 until the best convergence is obtained.

Figure 4-2. 4-pole and 6-pole Magnets Movement



Note : The 4-pole magnets and the 6-pole magnets interact, making dot movement complex.

4-2-5 Degaussing

Degaussing is required when poor color impurity appears on the screen. This monitor uses an automatic degaussing circuit that is activated when the power is on. The manual degaussing will be fully functional after the monitor has been in operation for 20 minutes through OSM degaussing function.

The degaussing effect is confined to the picture tube since the coils are mounted at the back of the tube. Should any part of the chassis or cabinet becomes magnetized, it is necessary to degauss the affected area with a external degaussing coil.

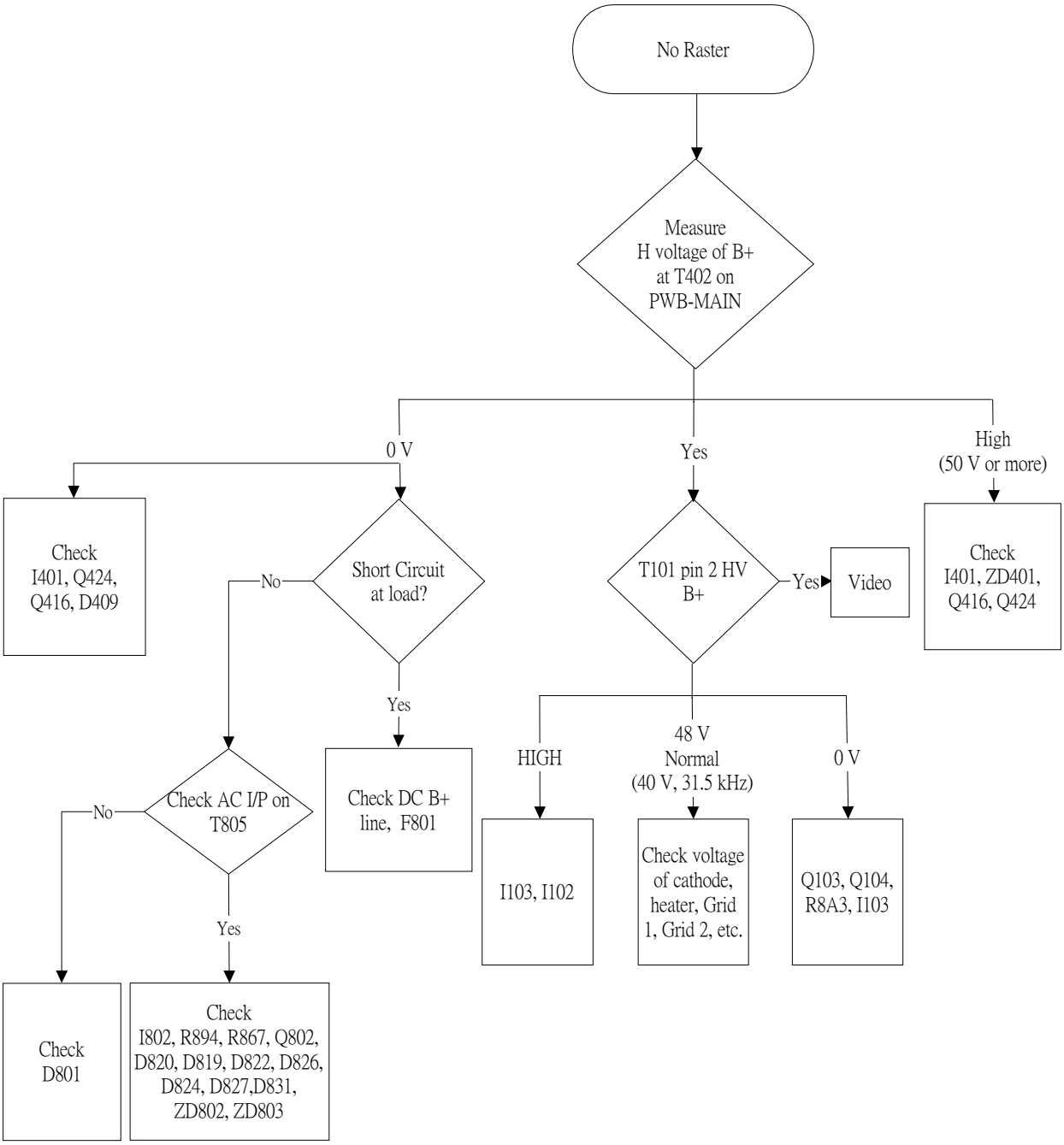
4-2-6 External Degaussing

1. Apply line voltage to the degaussing coil and move it in a rotary motion over the front, sides, and top of the monitor. The coil should be kept away from the rear of the monitor to avoid damaging the magnetic neck components.
2. Slowly rotate and move the coil away from the monitor to about 6 feet beyond the point where no effect on the CRT will be noticeable.

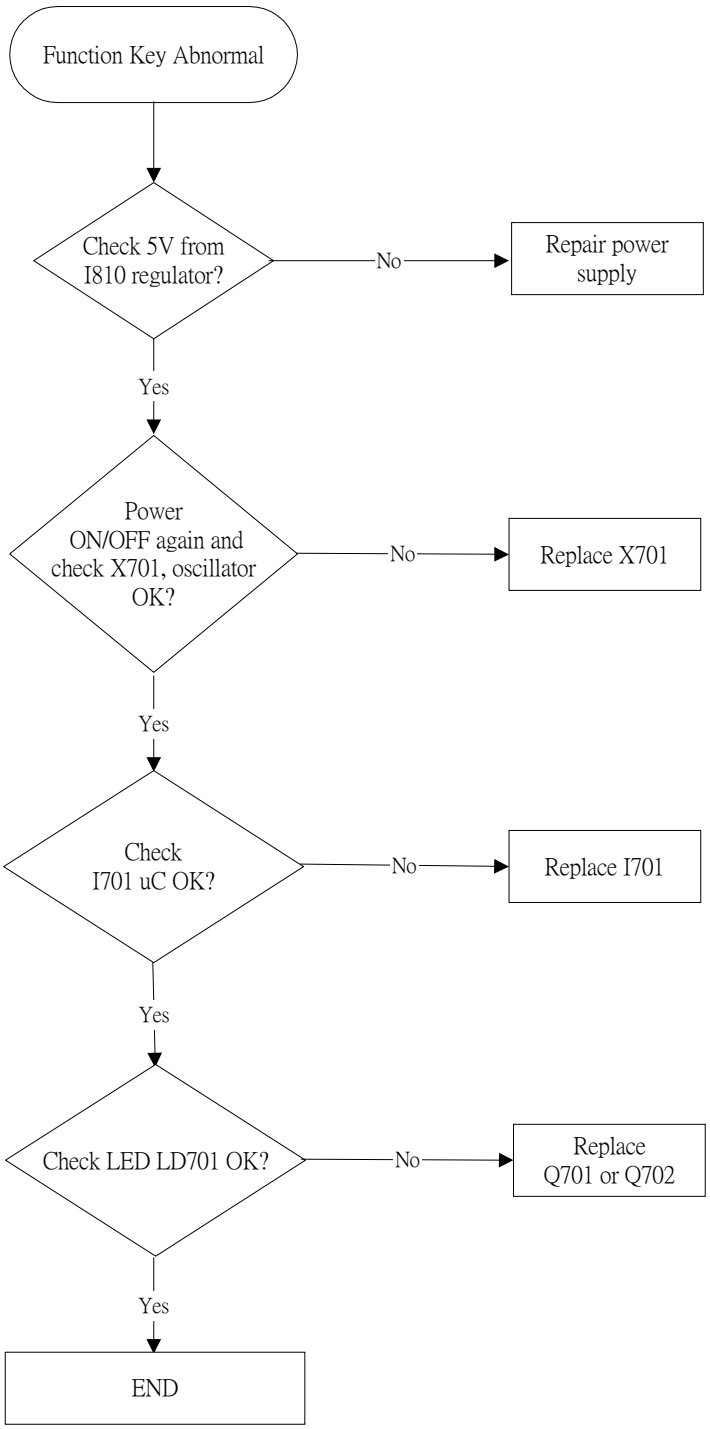
For proper degaussing, it is essential that the field be gradually reduced by moving the coil slowly away from the monitor. The degaussing coil must never be shut off or disconnected while near the monitor, as this would introduce a strong field instead of canceling the effect of the stray fields.

5 Troubleshooting

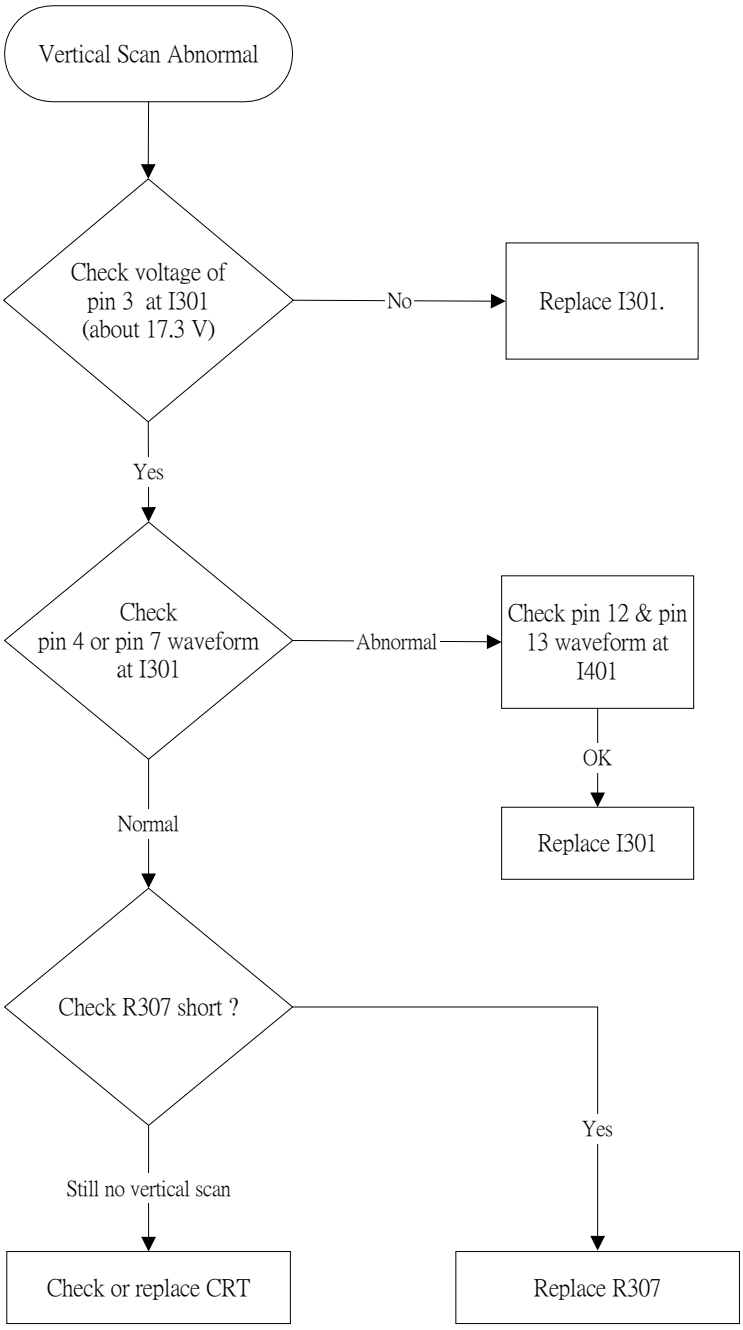
5-1 No Raster



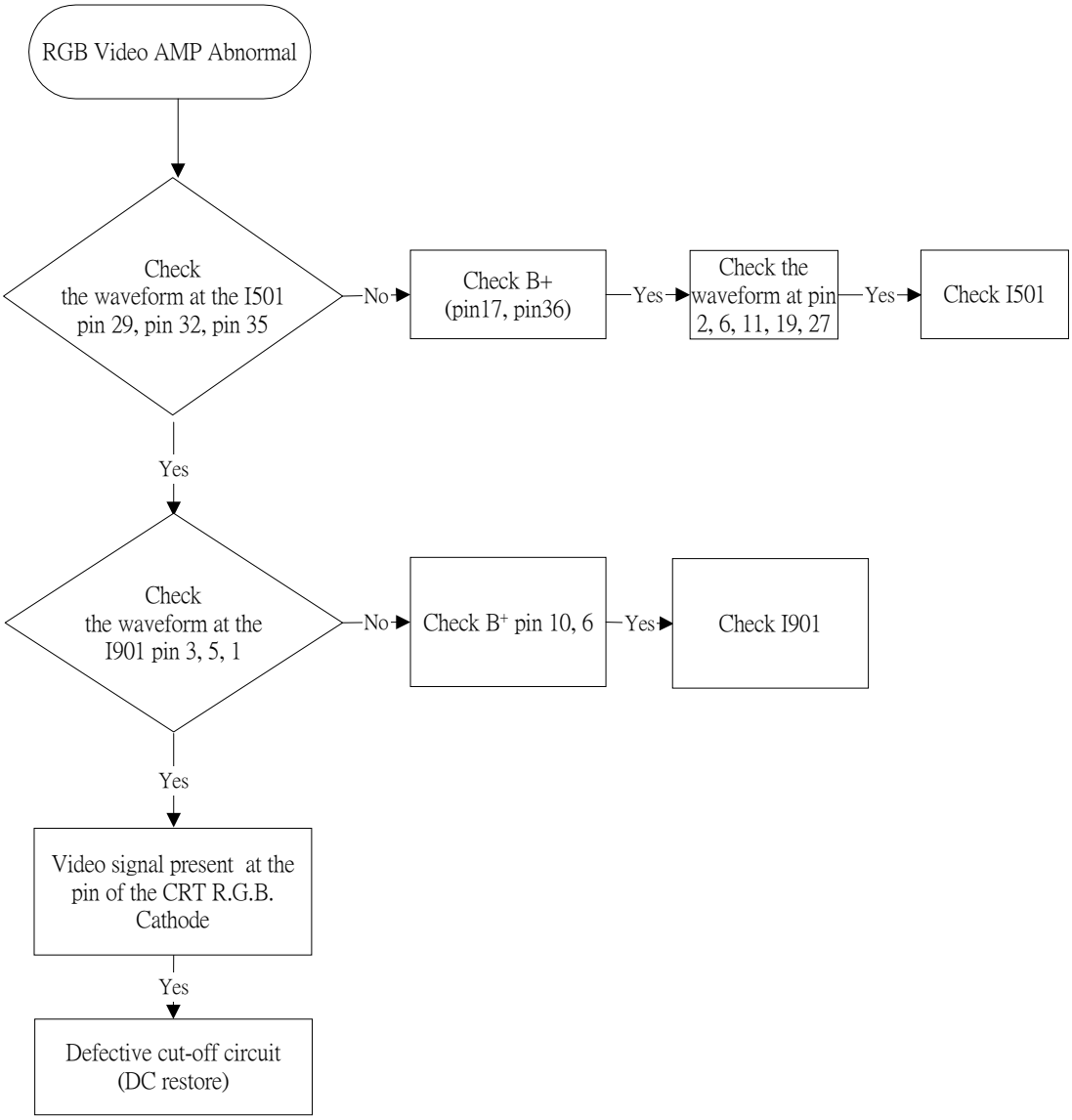
5-2 Function Key Abnormal



5-3 Vertical Scan (Raster is one horizontal line)



5-4 R.G.B. Video Amplifier Abnormal



6 Recommended Parts List

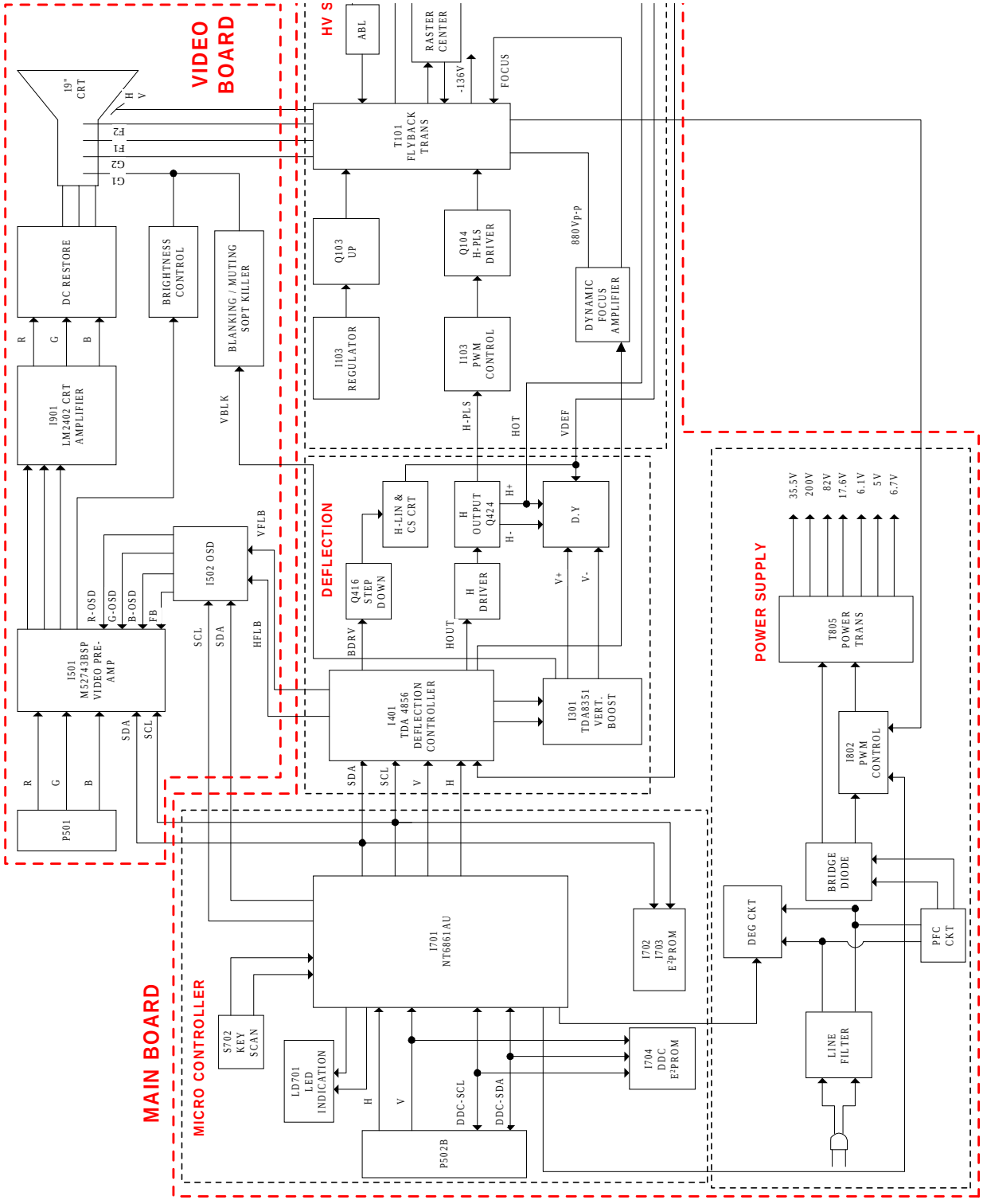
Note:1. The components identified by "⚠" mark are critical for X-ray safety. Replace these with exactly the same parts specified.

2 . There is only OTP IC at the model beginning (FPR stage or before). When it put in mass production and there must be Mask coming out. If you have spart parts need, please use BOM to get the last release part number and related information.

No.	Location	Part Number	Description
1	C810	6312647122	ALU uF 470 400V F 105C 30x45
2	D801	6417001100	DIODE BRIDGE FBI4K7M1 4A/800V
3	D819 D824 D831 D827	6412010807	DIODE BYM26C 2.3A/600V
4	D820 D826	6412000520	DIODE RL4A 3A/600V
5	D822	6412022207	DIODE SF20-02G 2A/200V
6	F801	6851504051	FUSE TIME LAG H-BRK 19181-4A
7	I301	6442011210	IC TDA8351/N6 9P SIL PHILIPS
8	I401	6442025200	IC TDA4856 32P SDIP (PHILIPS)
9	I501	6442024210	IC M52743BSP 36P SDIP MITSUBISHI
10	I701	6448014500	IC NT68P61AU 42P PDIP OTP NOVAT
11	I703	6448007930	IC KS24C04 (SAMSUNG)
12	I802	6442006720	IC KA3843B 8P PDIP
13	I901	6442025000	IC LM2402 11P TO-220 NS
14	L405	6111169130	COIL CHOKE 1.65 uH DR6X8
15	L404	6881001505	BEAD CORE W5 RH3.5x6x1.0T
16	Q104	6426006300	FET N-CHNL SSH7N90A FAIRCHILD
17	Q416	6427000900	FET P-CHNL SFS9634 FAIRCHILD
18	Q402	6421000325	TR NPN 2SC1815-Y(TPE2) TOSHIBA
19	Q103	6426006300	TR N-CHNL IRFS634A FAIRCHILD
20	Q424	6421005200	TR NPN 2SC5515 (PANASONIC)

No.	Location	Part Number	Description
21	Q802	6426002201	FET N-CHNL SSH 10N 80A
22	I501	6442024210	IC 52743BSP 36P MITSUBISHI
23	R415	6212147254	CF KOHM 4.7 1/4W J T26 MINI
24	ZD401	6414150004	HZ15-2 ZNR 15V/0.5W
25	R803	6203459017	POSISTOR 4.5 DGC3D4R5Q27C 3PIN
26	R802	6201100052	THERMISTOR 10 OHM 8A P=7.5 TKS
27	R822	6221222852	MOF OHM 0.22 2W J HOR
28	T402	6119003205	COIL LINEAR DYNAMIC TLN-1032E
29	T40A	6139000300	XFRMER H-CENT 5mH THC-1003
30	T801 T802	6138003100	LINE FILTER
31	T805	6131051820	XFRMER PWR TPW1069 ER42/15 LSE
32	X701	6449000700	CRYSTAL HC49/U 8MHZ 50PPM 7pF
33	I804	6442030500	IC MC33260 8P MOTOROLA
34	D807	6412000520	DIODE RL4A/600V 50ns SANKEN
35	Q814	6426005410	FET N-CHNL IRFS840A 4.6A/500V
36	R823	6231039852	WW 0.39ohm 5WJ HOR

7 Block Diagram



MEDION®
COMPUTER

LITE-ON TECHNOLOGY CORP.

5 F, No. 16, Sec. 4, Nanking E. Road, Taipei, Taiwan

Tel: 886-2-25706999 Fax: 886-2-25706888

URL:// www.liteontc.com.tw

Printed in Taiwan